openreach

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Suppliers' Information Note

For The Openreach Network

OPENREACH WHOLESALE EXTENSION SERVICES 10, WHOLESALE END TO END EXTENSION SERVICES (WES/WEES 10) and WHOLESALE EXTENSION SERVICE LOCAL ACCESS 10 (WES-LA 10)

Service & Interface Description

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1 Introduction

This Suppliers' Information Note (SIN) describes the interface provided with Openreach Wholesale Extension Services 10 (WES10), Wholesale End to End Extension services (WEES10) and Wholesale Extension Services Local Access 10 (WES-LA 10 managed). It also provides additional general information on WES/WEES Services and on some of the physical aspects of the NTEs currently being deployed for new customer orders.

WES/WEES Services are high speed, point-to-point data circuits that are permanently connected and available 24 hours a day, 365 days per year. WES provides a secure link between an end user Site and the Communications Provider's (CP's) network at a CP's Site. Openreach WEES provides a secure link between an end user site and another end user site. WES-LA provides a secure link between an end user site and the serving exchange serving that site, with the circuit terminating at a CP site or presence at that serving exchange (BT Locate space).

Any specific technology mentioned in this document is current as of today, however it may be subject to change in the future. Should the specification of the interface be changed, this will be notified by a new issue of this SIN. Openreach reserves the right to adapt technology to deliver WES/WEES Services as new developments are made. All services are delivered over an uncontended transmission path.

SPECIAL NOTICE

Openreach has formally notified the withdrawal from new supply of all WES WEES BES products up and including 1Gbit/s as from 1st June 2011 along with the removal of all modify options (Bandwidth upgrade, shift, re-site & rearrange) as from 1st June 2013

Openreach have notified End of Support as from 1 April 2018 for all WES WEES BES (up to and including 1Gbits). Please refer to Openreach briefing GEN061/14 (www.openreach.co.uk)

WES WEES BES 2.5Gbit/s and 10Gbit/s will remain available along with WES Aggregation

2 Service Outline & Options

2.1 General

The Openreach Wholesale Extension Services and Wholesale End to End Extension Services allow a user to interconnect Ethernet – CSMA/CD Local Area Network segments conforming to ISO/IEC 8802-3 (IEEE 802.3)[1] standards.

The WES/WEES 10 service operates at a data transmission rate of 10 Mbit/s between NTEs, and offers a number of options of transmission distance range between Sites.

Depending upon the service chosen, the appropriate type of Network Terminating Equipment (NTE) will be provided at both ends of the uncontended transmission infrastructure, terminated within the customer/CP premises. The WES-LA only provides access as far as the serving exchange and, as this is the only exchange involved, no main link is provided and main link radial distances between exchanges are not applicable.

For the WES product the uncontended transmission path is routed via the Openreach network and is cabled directly between the third party customer Site and the Communications Provider's (CP's) network at a CP's Site. WES-LA provides a secure link between an end user site and the serving exchange serving that site, with the circuit terminating at a CP presence at that serving exchange (in a Licensed Facility in the BT Exchange).

For the WEES products the uncontended transmission path is routed via the Openreach network and is cabled directly between a third party customer Site and another third party customer Site.

The WES/WEES 10 can be ordered with or without the connection for operational support purposes to the Wholesale Extension Services management platform. This was launched as an option on 30 September 2006.

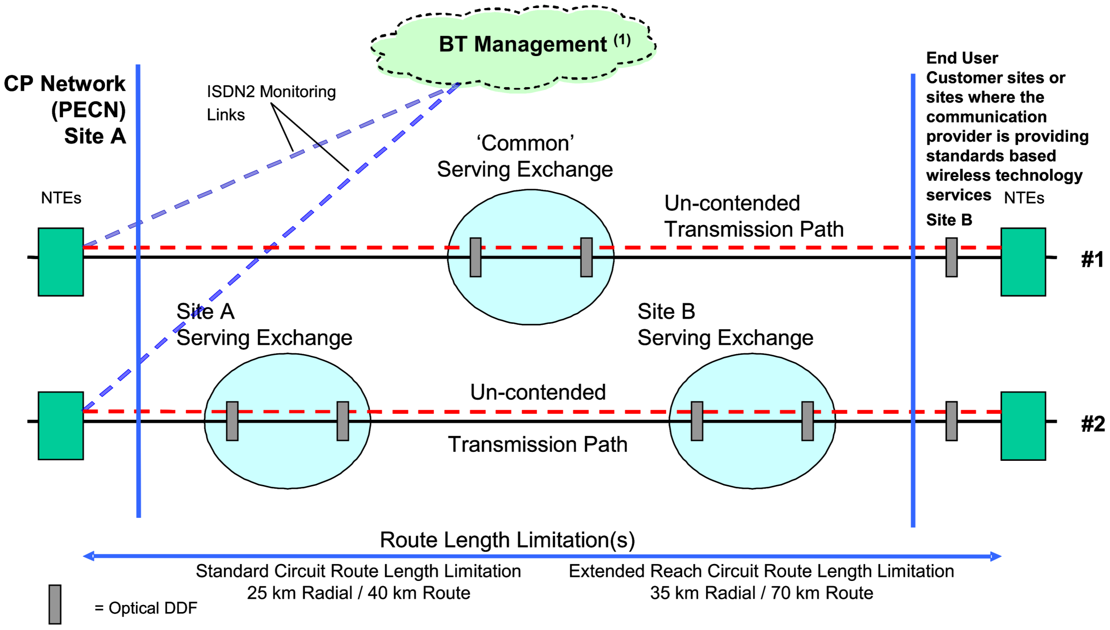
Wholesale Extension Service: WES/ WEES/ WES-LA	Principal Ethernet Network Service Characteristic:	CP / Customer Interface Option:	Maximum allowable **Radial** Distances between Customer Premises/Sites: *(Note 1.)*	Maximum **Route & Range** Distances between Customer Premises / Sites: *(Note 2.)*	Half / Full Duplex Operation:
10	Bridge	10BaseT – (RJ45)	25km	40km	Full or Half Duplex

Table 1. List of Services & Principle Features

Note 1. This is the direct distance "as the crow flies" between the two locations. Main link radial distances are not applicable for WES-LA as this has only one serving exchange.

Note 2. The maximum Route distance is the limiting factor of either the physical transmission limit between NTEs over the provided interconnecting transmission infrastructure, or alternatively the maximum range that the service may be extended to due to other technical considerations (e.g. optical loss).

A schematic of the WES 10 service arrangement is shown in *Figure 1*.


BT Management (1)
CP Network
(PECN)
Site A
ISDN2 Monitoring
Links
NTEs
'Common'
Serving Exchange
Un-contended
Transmission Path
End User
Customer sites or
sites where the
communication
provider is providing
standards based
wireless technology
services
NTEs
Site B
#1
Site A
Serving Exchange
Site B
Serving Exchange
Un-contended
Transmission Path
#2
Route Length Limitation(s)
Standard Circuit Route Length Limitation
25 km Radial / 40 km Route
Extended Reach Circuit Route Length Limitation
35 km Radial / 70 km Route
= Optical DDF

1) Optional on WES10

Figure 1. WES 10 Service Configurations

Note 3: *Figure 1* depicts two separate circuit scenarios, not a combined service. The upper horizontal black line (#1 – NTE to NTE) represents a WES circuit where both ends have a common serving exchange.
The lower line (#2) represents a circuit where the ends are served from different exchanges.

Note 4: The service cannot be purchased as a point-to-point circuit directly connected between two 3rd party customer sites, whether or not the physical route is via a BT exchange. This diagram is using current technology / delivery, this is subject to change.

A schematic of the WEES 10 service arrangement is shown in *Figure 2*.

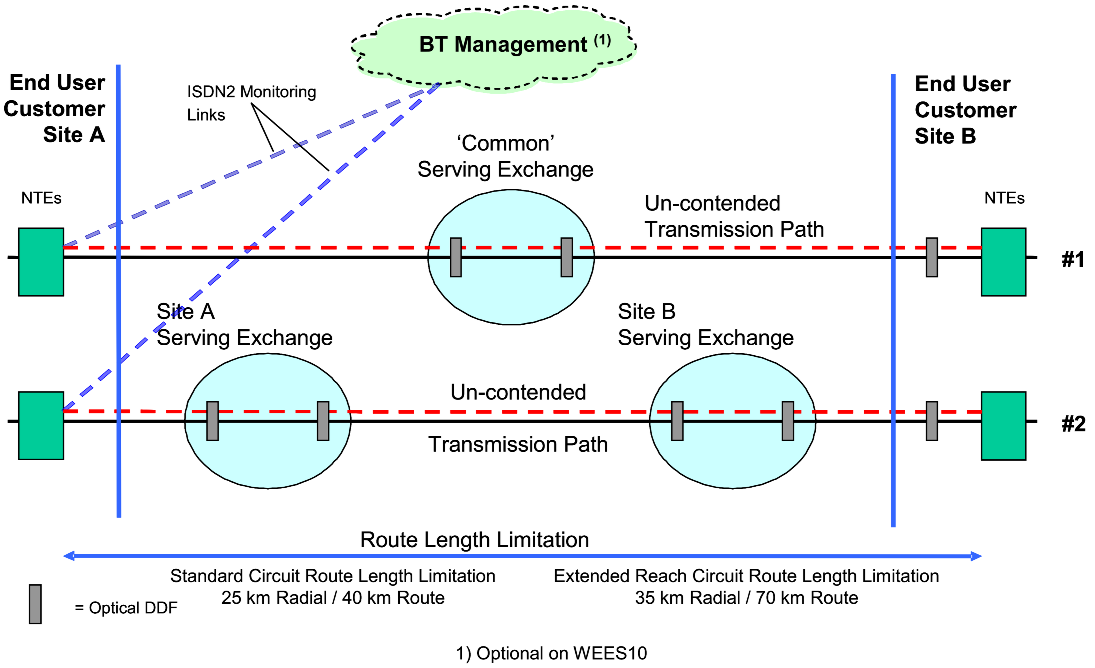

BT Management (1)
End User
Customer
Site A
ISDN2 Monitoring
Links
'Common'
Serving Exchange
End User
Customer
Site B
NTEs
Un-contended
Transmission Path
NTEs
#1
Site A
Serving Exchange
Site B
Serving Exchange
Un-contended
Transmission Path
#2
Route Length Limitation
Standard Circuit Route Length Limitation
25 km Radial / 40 km Route
Extended Reach Circuit Route Length Limitation
35 km Radial / 70 km Route
= Optical DDF
1) Optional on WEES10

Figure 2. WEES 10 Service Configurations

Note 5: Figure 2 depicts two separate circuit scenarios, not a combined service. The upper horizontal black line (#1 – NTE to NTE) represents a WES circuit where both ends have a common serving exchange. The lower line (#2) represents a circuit where the ends are served from different exchanges

A schematic of the WES-LA 10 managed service is shown in *Figure 3*

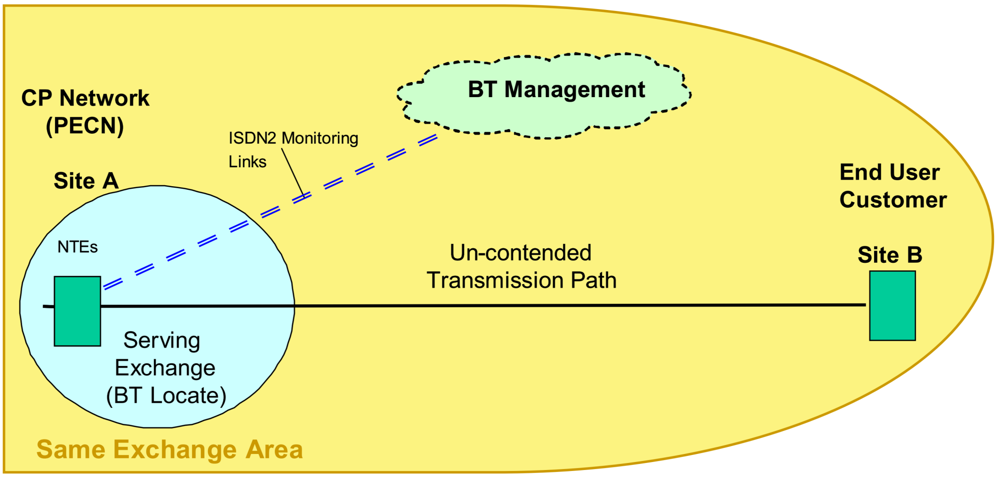

CP Network
(PECN)
BT Management
ISDN2 Monitoring
Links
Site A
NTEs
End User
Customer
Site B
Un-contended
Transmission Path
Serving
Exchange
(BT Locate)
Same Exchange Area

Figure 3. WES-LA 10 Managed Service Configuration

It is anticipated that CPs / customers will use these services for the interconnection of conventional Ethernet Hubs to workstations and the interconnection of their Local Area Networks.

WES/WEES/WES-LA 10 service additionally offers the Bridge feature; automatically learning and filtering the transmission of traffic destined for the local end based on MAC addresses.

The overall design of the customer network, including the WES/WEES circuit, will need to be within the normal operating ranges and parameters of Ethernet to operate satisfactorily.

Where the service offers a duplex option, both ends and NTE should be configured for the same mode of operation (i.e. either Half or Full Duplex).

2.2 WES/WEES/WES-LA 10 Features

This service includes the IEEE 802.1d[2] Bridging functionality, which allows for the learning and filtering of traffic packets destined for those hosts connected at the local end. Packets destined for these local end (MAC) addresses will not be forwarded across the transmission path to the distant end, after these (MAC) addresses have been learnt and until the system's Cache memory has been refreshed after a host has been removed.

The Full Duplex option is in accordance with IEEE 802.3x[3]. The NTE is configured by BT to the customers requirements of either Half or Full Duplex.

The WES 10 NTE is capable of transmitting frame sizes from 64 bytes to a maximum of 1548 bytes. This is to maintain compatibility with a number of frame tagging formats, in particular VLAN tagging as specified in IEEE 802.1q[4] with 1522 byte frame size.

Note. The definition of frame lengths includes the 4 byte CRC but does not include any preamble.

Where packet-loss sensitive applications such as Voice over IP (VoIP) are carried over Half-Duplex network arrangements, it is recommended that the throughput should not exceed 40%, to prevent any packet loss due to collisions. This is a limitation of the Ethernet protocol in Half-duplex mode and not of the WES 10 NTE.

3 Customer Interface

3.1 General

The interface requirements are specified in ISO/IEC 8802-3 (IEEE 802.3)[1].

Attention is drawn to the Intellectual Property Rights (IPRs) set out in the preface of this agreed international standard. It is the responsibility of the supplier of CPE/CP equipment to ensure that they have the necessary rights from the owner of the IPR. The IPR owner has stated that they are willing to negotiate licences under reasonable and non-discriminatory terms and conditions with applicants throughout the world.

The interface supports Ethernet, operating at 10 Mbit/s. The interfaces provided on the WES 10 services are detailed below.

3.2 Connector – RJ45 Interface

The interface requirements are specified in the 10BaseT Clause 14 of ISO/IEC 8802.3 (IEEE 803.2)[1].

The Interface connector on the NTE consists of a RJ-45 type socket.

The CP / Customer provides the Category 5 connecting cords between the NTE and their equipment, and these should be no longer than 100 metres.

The connector pin outs are shown for information.

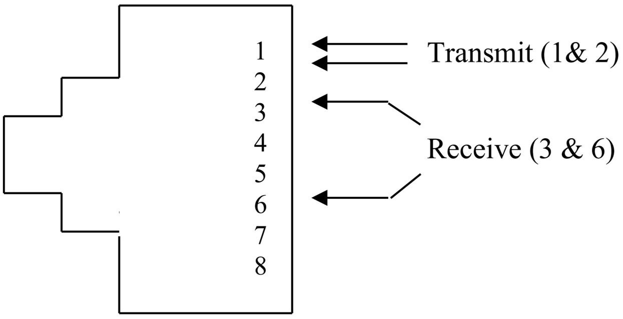


Figure 4. WES/WEES/WES-LA 10 NTE RJ45 Connector Pin Out Connections

3.3 Network Link Loss Forwarding

When a break is detected on the Openreach network link, the customer interface (RJ-45 port) is shut down to indicate the state of the infrastructure. This continues until such time as the network break is repaired.

3.4 User Link Loss Forwarding

User Link Loss Forwarding (U-LLF) allows the notification of failure of a customer device at one end of a WES or WEES service to be propagated to a customer device at the other end of the same service.
User Link Loss Forwarding is available as a unidirectional service for the following managed products:

- WES 10 (managed)
- WES 10 Local Access
- WEES 10 (managed)

The availability of User LLF is dependent on the correct level of NTE hardware and software at each end of a circuit.

User LLF is offered as a unidirectional service only. For WES it is recommended that this is between the CP's PoP and the end user customer only. This means that the WES circuit is taken down using User LLF only if problems occur at the CPs equipment at the CP PoP site end of the circuit. If problems occur at the end user customer's equipment, the circuit will not be taken down. For WEES this can be set in either direction (A to B; B to A).

A bidirectional U-LLF service is not offered since it may complicate fault finding as it becomes extremely difficult for both Openreach and the Service Provider to determine whether the cause of the fault was due to end customer or CP PoP. Also by having this feature work in both directions may prevent some links from automatically re-establishing after an interruption.

4 Power Supply Requirements

4.1 General

By placing a order with BT the customer has accepted the conditions placed by BT. In relation to powering of equipment, the customer must comply with the requirements of BS7671 and the details giving within the 'DC Power Planning and Installation Guide for WES-BES Products' document.

The Openreach NTE is locally powered and offers AC or DC power options. The CP will be required to provide either a local 50Hz AC supply in the form of standard 13 Amp power socket(s); or dual -50V DC power distributions and Earth connections, with all wiring colour schemes conforming to BS7671 (IEEE Wiring Regulations). It will be the customers' responsibility to ensure that the power supply is fused and safe for Openreach to use. These should be in close proximity to the NTE installation location.

4.2 Installation and Testing

In addition to the NTE and Chassis powering requirements below, a spare 50Hz AC mains supply 13A socket should also be provided in close proximity to the NTEs, to power BT test equipment during both initial commissioning and subsequent maintenance support activities.

4.3 AC Power Connection

AC power connection between Openreach equipment and the power socket will be made using a standard IEC320 C13-14 power lead fitted with a standard 13A plug. The NTE itself has dual power supply units.
Orders placed from 3rd April 2008, new NGN compatible NTE may be supplied for unmanaged services where both ends of the circuit terminate with stand-alone 1U high NTE. These NTE have dual power supply units and require two 13A power sockets. This has the benefit of allowing for separate power supplies to enhancing resilience.

- **For most installations:**
  This will require two mains connections for each NTE provided, and the consumption of the Openreach NTE and power unit chassis in this unmanaged service arrangement will be no more than 21 Watts per NTE.

- **For larger installations (at Openreach discretion):**
  At Openreach's discretion, where a large number of systems of one type are being deployed, a 16-slot NTE chassis version may be deployed. This will

require two mains connections for each 16-slot chassis provided. The consumption with a maximum number of 16 service cards provided will be no more than 200 Watts per chassis.

4.4 DC Power Connection

The DC In-Line (Molex) connector is specified as the standard method of connecting DC power by Openreach, and represents the "Demarcation Point" between Openreach and the customer. At their site, the customer is required to provide suitable power and earth connection up to the demarcation point, and be responsible for the supply, wiring and labelling up to the demarcation point. Openreach will not supply or install the DC distribution system as part of the standard Ethernet installation.

- **Customer-provided wiring up to the Openreach specified In-Line connector**

  Wiring, MCB isolation or fuse (i.e. C Type MCB or Cartage Fuse), must be provided by the customer, up to and including the DC in-line connector, as per BT's requirements stated within the 'DC Power Planning and Installation Guide for WES-BES Products' document with respect to:

  (i) Correctly rated MCB/Fuse: refer to the WES/WEES product handbook for correct rating
  (ii) Correct labelling of wiring and MCB/fuse positions compliant with BS 7671
  (iii) Correct size of cable for required voltage drop at required maximum current
  (iv) Separately fused isolatable A & B power supplies, as detailed in the 'DC Power Planning and Installation Guide for WES-BES Products' document.

  The in-line connector has a maximum current handling capability of 11A, and is not to be used for equipment requiring greater than a 11A supply (such as the Nortel OPTera 5200 equipment, which require 20A feeds).

4.5 Additional Details

For further details on the provision of DC Power, see the 'DC Power Planning and Installation Guide for WES-BES Products' available on the Openreach Ethernet website.

If there is a conflict between DC power information contained in the 'DC Power Planning and Installation Guide for WES-BES Products' and the SIN document, the order of precedence shall be as follows:

(a) DC Power Planning and Installation Guide for WES-BES Products
(b) SIN

5 Further Information

For enquiries concerning connection availability between particular sites and for further information on the WES/WEES/WES-LA 10 service please contact your company's Openreach Sales & Relationship Manager or see http://www.openreach.co.uk/orpg/products/wes/eoiwes.do.

6 References

Ref:	Standard / Requirement:	Title / Description:	Date:
[1]	ISO/IEC 8802-3	ISO/IEC edition of ANSI/IEEE 802.3 CSMA/CD Ethernet Standard. (Clauses within the ISO document correspond to clauses within IEEE 802.3 document)	-
[2]	IEEE 802.1d	IEEE Recommendations for Bridging: Learning and Forwarding	-
[3]	IEEE 802.3x	IEEE Recommendations for Local and Metropolitan Area Networks: Specification for 802.3 Full Duplex	1997
[4]	IEEE 802.1q	IEEE Recommendations for Virtual LANs	1998

7 Abbreviations

AUI	Attachment Unit Interface
PLS	Physical Signalling
ANSI	American National Standards Institute
BS	British Standards
CP	Communications Provider (Providers of Electronic Communications Services)
CPE	Customer Premises Equipment
CSMA/CD	Carrier Sense Multiple Access with Collision Detection {Ethernet}
DDF	Digital Distribution Frame
IEC	International Electrotechnical Commission
IEEE	Institute of Electrical and Electronics Engineers {USA}
IPR	Intellectual Property Rights
ISO	International Standards Organisation
ITU-T	International Telecommunications Union – Telecoms Sector {formerly CCITT}
LAN	Local Area Network
MAC	Media Access Control (& Hardware Device Address)
MCB	Mini Circuit Breaker
NTE	Network Terminating Equipment
NTP	Network Terminating Point

SAN	Storage Area Network
SHDS	Short Haul Data Service
SIN	Suppliers' Information Note
SQE	Signal Quality Error
VLAN	Virtual Local Area Network
WES	LAN Extension Service

8 History

Issue:	Date:	Notes:
Issue 1.0	15 October 2004	First Issue.
Issue 1.1	22 October 2004	Link Loss Forwarding text removed. "Customer" clarified. Figure 1 replaced. Editorial Changes.
Issue 1.2	29 September 2006	Changes made for Equivalence of Input compliant products, including addition of WEES 10.
Issue 1.3	21 December 2006	Addition of WES-Local Access
Issue 1.4	7 March 2007	Contact details in "Further Information" clause updated.
Issue 1.5	29 October 2007	Service description amended in accordance with updated DC power guidance
Issue 1.6	4 March 2008	Service description amended in accordance with updated AC power guidance
Issue 1.7	13 October 2008	Amended in order to add new sections on Network Link Loss Forwarding and User Link Loss Forwarding.
Issue 1.8	25 June 2009	Editorial amendments, including general clarifications and updated references
Issue 1.9	February 2011	Amended to notify no new service will be made available
Issue 1.10	February 2013	Amended to notify no new supply of Shift, re-arrange, resite or bandwidth upgrade on all WES WEES BES (up to 1G/bit) as from 1st June 2013
Issue 1.11	February 2015	Amended to notify End of Support as from 1 April 2018 for all WES WEES BES (up to and including 1Gbits). Change SINet site references from http://www.sinet.bt.com to http://www.btplc.com/sinet/
Issue 1.12	May 2020	Change SINet site references from http://www.btplc.com/sinet/ to https://www.openreach.co.uk/orpg/home/helpandsupport/sins/sins.do
Issue 1.12	September 2021	Product notified end of life. No changes required.
Issue 1.12	October 2022	Product notified end of life. No changes required.
Issue 1.12	October 2023	Product notified end of life. No changes required.
Issue 1.12	October 2025	Product notified end of life. No changes required.

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